Department of Justice

STATEMENT

OF

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COMMITTEE ON GOVERNMENT REFORM
SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS, AND
INTERNATIONAL RELATIONS AND THE
SUBCOMMITTEE ON TECHNOLOGY, INFORMATION POLICY,
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UNITED STATES HOUSE OF REPRESENTATIVES

REGARDING

INTEROPERABLE COMMUNICATIONS TECHNOLOGY

ON

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Good morning Mr. Chairmen, Mr. Clay, Mr. Kucinich, and Members of the Subcommittees. I am Dr. John Morgan, Acting Assistant Director for Science and Technology of the National Institute of Justice (NIJ). As you know, NIJ is the research, development, and evaluation arm of the Department of Justice, and is a component of the Department's Office of Justice Programs. I am pleased to appear before you today to discuss the history of NIJ's Advanced Generation of Interoperability for Law Enforcement (AGILE) Program, to present current interoperability solutions, and to discuss research and development plans that can help the law enforcement and first responder communities develop long-term interoperability solutions.

AGILE's Mission

As you are aware, during incidents such as multiple car accidents, natural disasters, domestic terrorism, or high-speed pursuits, public safety officials from different disciplines, and even different states, have an immediate need to talk to one another. They need to share information effortlessly or lives can be lost. Often, however, police officers, firefighters, emergency medical personnel, and other public safety officials cannot depend on wireless communications in an emergency, hindering their ability to respond. Interoperability allows multiple parties to exchange information seamlessly – when and where it is needed. AGILE is helping bridge the gap in emergency communications by identifying, adopting, and developing interoperability solutions that include open architecture standards for voice, data, image, and video communications systems. These solutions will allow multiple parties to exchange information on the spot – no matter where that "spot" is. It will let users exchange information among fixed facilities, mobile platforms, and even personal devices.

AGILE also researches new technology solutions when existing technologies used in an emergency response fall short, and aims to raise the awareness of interoperability issues through various outreach programs so that policymakers and public safety leaders can make informed and cost-effective decisions.

Overall, the AGILE Program's mission is to assist state and local law enforcement and public safety agencies to effectively and efficiently communicate with one another, through both voice and data media, across agency and jurisdictional boundaries. AGILE accomplishes its mission through four main program components: (1) supporting research and development of technology; (2) testing, evaluating, and piloting technologies; (3) developing standards; and (4) educating and reaching out to public safety practitioners and policymakers.

Much of AGILE's success can be attributed to the partnership with several of NIJ's regional technology centers, especially the Rocky Mountain and Northeast centers, and a partnership with the National Institute of Standards and Technology's (NIST) Office of Law Enforcement Standards (OLES).

AGILE's History

One of NIJ's earliest interoperability projects, undertaken in the mid-1990s, connected the dispatch centers (radio communication systems) of 12 agencies operating in San Diego County, including the Immigration and Naturalization Service, California Highway Patrol, and San Diego Police Department. The Border Tactical Communication System, or BORTAC, was undertaken jointly with the Office of National Drug Control Policy and the U.S. Navy's Public Safety Center in San Diego. BORTAC, which has been operational since 1996, demonstrates

that overcoming institutional and cultural barriers in developing interoperable systems is often even more important than overcoming existing technical barriers.

Following BORTAC, NIJ's interoperability projects portfolio grew to include InfoTech in southern Florida and COPLINK in Arizona, along with continued funding support for the development of the P-25 (NTIA 102 Series) digital wireless standard. The NIJ-funded study, "State and Local Law Enforcement Wireless Communications and Interoperability: A Quantitative Analysis," was released in 1998, and further demonstrated the importance of interoperable communications to public safety. In late 1998, NIJ formed the AGILE program to coordinate these projects, along with additional awards for technology development in fields such as software defined radio (SDR).

AGILE's Support for Public Safety & Policymakers

A basic tenet of the AGILE Program is to help build consensus among existing national organizations and associations representing state and local public safety. The 45,000+ public safety agencies in this country do not have a single entity or organization to represent their activities and interests. Rather, because of the diversity among these agencies, it takes a federation of associations representing public safety telecommunications, the National Public Safety Telecommunications Council (NPSTC), to present a collective "voice" on communications issues. As part of the AGILE Program, NIJ provides support to the Council by creating and funding the work of a NPSTC Support Office, located at NIJ's Rocky Mountain regional technology center, which acts as the secretariat for this diverse organization.

NIJ's strong relationship with the public safety communications leadership is allowing the AGILE program to move forward in institutionalizing the issue of interoperability for state

and local leaders. In April 2002, NIJ convened the National Task Force on Interoperability (NTFI), a collection of state and local elected and appointed officials and their representative associations, to develop a set of materials to explain the issue and importance of interoperability from the funding policymaker's perspective. In February 2003, NTFI released a guide for public officials titled, "Why Can't We Talk? Working Together To Bridge the Communications Gap To Save Lives," which has received much favorable attention.

The AGILE/SAFECOM Partnership

The AGILE Program has developed a strong partnership with the Wireless Public Safety Interoperable Communications Program (SAFECOM). SAFECOM is the umbrella program within the federal government created to help local, tribal, state, and federal public safety agencies improve public safety response through more effective and efficient interoperable wireless communications. AGILE's years of experience in the areas of technology research and development, standards development, and outreach and support to the national associations enable it to assist SAFECOM in fulfilling its mission. To best integrate the respective programs, AGILE and SAFECOM have merged their planning in these areas.

Short-Term Interoperability Solutions

Federal programs will encourage planning for and implementation of systems and agreements at all levels that leverage existing capabilities and focus interim procurement and fielding actions to enhance interoperable communications. Mutual aid agreements should provide detailed plans, protocols, and procedures for ensuring effective near-term interoperable communications among local and regional jurisdictions, and provide a means to efficiently implement longer-term Project SAFECOM objectives.

In order to meet the need for short-term interoperable solutions, NIJ has created a process to research, evaluate, test, and implement today's commercially available technologies. The law enforcement community's immediate interest has been in "interoperability gateways," hardware and software that can bridge disparate radio systems. The AGILE program has tested and evaluated gateway products from several vendors, including the ACU-1000 from Raytheon Corporation and the ICRI from Communication-Applied Technology, and is in the process of evaluating several other products, including the new software-based gateway from SyTech Corporation. These products typically are tested first in a laboratory to determine their potential suitability for operation in a public safety environment.

Following extensive lab tests, the products are placed in an operational test bed. An example of an operational test bed is the interoperability gateway subsystem that has been installed at the Alexandria, Virginia, Police Department's (APD) communications center. The system used there, an ACU-1000, has effectively tied together the radio systems of various public safety agencies in metropolitan Washington, D.C. The result is that the region's multiple law enforcement and public safety agencies that use radio systems operating in different frequency bands, or use the same frequency band but with incompatible equipment, now have direct voice radio communications with each other. Lessons learned from the operational test beds are then promulgated through discussions of the AGILE program by NIJ staff and others at conferences, through the AGILE Web site, through NIJ publications, and through a CD-ROM (AGILE Interoperable Resource CD).

The extent of AGILE's success in Alexandria became apparent in early 2002 when the Washington Area Council of Governments (COG) Police and Fire Chiefs committees adopted

the APD model as the region's communications interoperability system. That marked the beginning of the Metropolitan Interoperability Radio System (MIRS). The COG Police and Fire Communications subcommittees established an area-wide protocol for the operation and execution of the system, and more public safety agencies continue to be added to the MIRS.

Through NIJ's partnership with NIST's Office of Law Enforcement Standards, NIJ works with the National Telecommunications and Information Administration (NTIA) and other key organizations to identify, develop, and adopt open architecture standards for voice, data, image, and video communication systems for the public safety community. We are currently involved in development of several standards and specifications for public safety wireless systems.

One such example is NIJ's support for the Telecommunications Industry Association's (TIA) 102 Series of radio standards, which define how digital voice radio equipment from different manufacturers can talk to each other. (The TIA 102 Series is also known as the Project 25, or P-25 Standard.) To date, only one out of seven sections of the P-25 standard have been approved. An overall objective of the AGILE program is to help accelerate and promote further development of the P-25 standard. This is especially true of the Inter-RF SubSystem Interface, which will allow disparate radio frequency subsystems to be interconnected to form a wide-area network. P-25 will have only a limited impact without completion of this and the other P-25 sections.

Through the Institute for Telecommunications Sciences lab in Boulder, Colorado, the AGILE program is performing compliance testing in conjunction with the Federal Law Enforcement User's Group to ensure that systems comply with P-25 standards for transmitter, receiver, and infrastructure characteristics – a process necessary for radio system planning and

design. The lab also is performing testing that demonstrates the interoperability of radio systems from different vendors, which is necessary for operational assurance.

NIJ is also participating in the development of the Project MESA (Mobility for Emergency and Safety Applications) standards. Project MESA responds to the growing demand for high-speed digital wireless systems to support public services such as public safety. It is one of the first international partnerships between industry and user organizations created to address the need for a globally accepted broadband wireless standard.

In addition to voice technologies, the AGILE program has examined other wireless information sharing initiatives, such as the Capital Wireless Integrated Network (CapWIN) project. CapWIN is a partnership of communities and agencies serving the Capital Region (Washington, D.C., Maryland, and Virginia) that are working together to develop an integrated mobile data wireless public safety network. This network will provide interagency communications to over 40 local, state, and federal agencies to ensure a coordinated response to any public safety incident that occurs in the Washington D.C. region. This innovative wireless communication system will serve as a model of open architectures and standards that can be replicated across the nation.

Long-Term Research and Development of Interoperability

Through the AGILE program, NIJ is helping to develop potential enabling technologies, such as Voice over Internet Protocol (VoIP) and software defined radio (SDR), both of which may play an important role in defining future interoperable communications systems. SDR technology, which replaces the internal hardware of a mobile radio system with flexible software functionality, promises to move us beyond the capabilities of today's mobile radio technology by

providing the dynamic ability for portable radios to adapt to multiple disparate radio environments. NIJ funded the development of a particularly innovative approach that accomplishes all of the radio's signal processing using a typical general purpose processor, such as a Pentium chip. This approach has also demonstrated success at using a handheld Pocket PC to emulate a public safety radio.

Another software defined radio project being developed through NIJ's Southeast Regional Technology Center and the Navy's Space and Naval Warfare Systems Center, both located in Charleston, SC, will be used as a test platform to determine whether it is feasible for public safety to use the Department of Defense's software radio architecture developed by the Joint Tactical Radio System (JTRS) Joint Program Office. We expect to be able to determine in the next 12-18 months whether the JTRS software will be a viable approach for use by public safety.

AGILE also worked with the National Public Safety Telecommunications Council to create an SDR Working Group, and then reached out to industry's SDR Forum, a consortium of over 120 companies that are involved in SDR, to determine their interest in working with the NPSTC's group. This relationship has flourished to the point that one member of the NPSTC group is now on the Forum's Board of Governors, and they are in the advanced planning stages of demonstrating this technology to various public safety agencies.

Through the AGILE program, NIJ is also evaluating the use of VoIP technology as a way to enhance the options for communicating in a voice radio patch. VoIP solutions from various companies are currently being explored, tested in the lab, and evaluated in the Alexandria

operational test bed. At the request of NPSTC, AGILE will also undertake a study in FY 2004 to determine the feasibility of assigning unique IP addresses to all radio equipment in the future.

Identification of Future Interoperable Communications Solutions

The key to developing a long-term interoperable solution is first to identify what the solutions need to accomplish. Once we know what needs to be accomplished, we can develop a technical description of the solutions that will meet this need. While we may not know today the exact configuration of these solutions, there is much that we can say now based on our experience in this area.

First, the sheer number of state and local public safety agencies in this country demonstrate that the bulk of first responder equipment and personnel resides at the local level. Given the diversity of agencies, geography, equipment, and demographics, there will not be a "one size fits all" solution. Instead, future solutions will need to take this diversity into account and accommodate a system-of-systems approach.

Second, the solutions must be scalable. The public safety community can benefit from routine interoperable communications both in their normal day-to-day activities and during any larger incident or event. Future interoperability systems need to address both concerns. If future systems are designed only for large-scale events, then their effectiveness will be diminished because public safety officers will be unfamiliar with the systems and how to use them. Instead, the systems should be able to used regularly and be scale-up effortlessly for larger events.

Third, future systems need to address the physical and proprietary barriers to interoperability. This means that they must accommodate all spectrum bands and interoperate with systems from all manufacturers.

Fourth, the systems need to be inherently reliable and resilient, if not redundant.

Fifth, any technical approach that the government supports must represent mainstream technology. The public safety community will benefit most if future solutions use technologies where society as a whole drives the cost of innovation rather than public safety alone. Mainstream choices are those where innovation, competition, and open architecture flourish while any advancements remain compatible with older systems for some time.

The development of long-term solutions is an ongoing process in which NIJ's AGILE program and SAFECOM are working together. The two programs are involved in activities that will help identify these future solutions. One of these activities is the creation of a Statement of Requirements that will describe how public safety wants to communicate, not how they currently communicate. Portions of this document are currently being vetted by a group of public safety first responders. Once completed, the entire Statement of Requirements will undergo a final vetting by NPSTC.

Other activities include SAFECOM's recent release of a Request for Information to identify existing interoperable technologies and planned release of a Broad Area Announcement (BAA), soliciting for innovative pilot projects. Through AGILE, NIJ will provide technical expertise to assist with the review and assessment of submissions to SAFECOM. In March 2004, SAFECOM will sponsor a session at the International Symposium on Advanced Radio Technology titled, "The Identification of a Viable Public Safety Communications Architecture."

In December, NIJ plans to release an interoperability research and development solicitation seeking applications to fund projects involving enabling technologies, such as SDR

and VoIP. SAFECOM representatives will participate in NIJ's review of these proposals and will benefit from the technology developed and lessons learned.

Much work remains on identifying future solutions for a viable approach to long-term interoperable communications. No matter what technical approach is chosen, the result should be a set of interface standards that will enable legacy and future radio systems to interoperate in a system-of-systems approach. From the activities described above, we fully expect that the Department's AGILE program, in partnership with the SAFECOM program, will be able to take the steps necessary to identify the communications solutions that law enforcement will need in the future.

Today's hearing demonstrates that your subcommittees understand that interoperability is an issue that affects all of us. Through the AGILE program, the National Institute of Justice is working to improve public safety communication in way that can save lives and make all of America's communities safer.

This concludes my statement, and I will be happy to answer any questions.